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ALASKA (TER) DEPARTMENT OF HEALTH
COMMUNITY FACILITIES IN ALASKA

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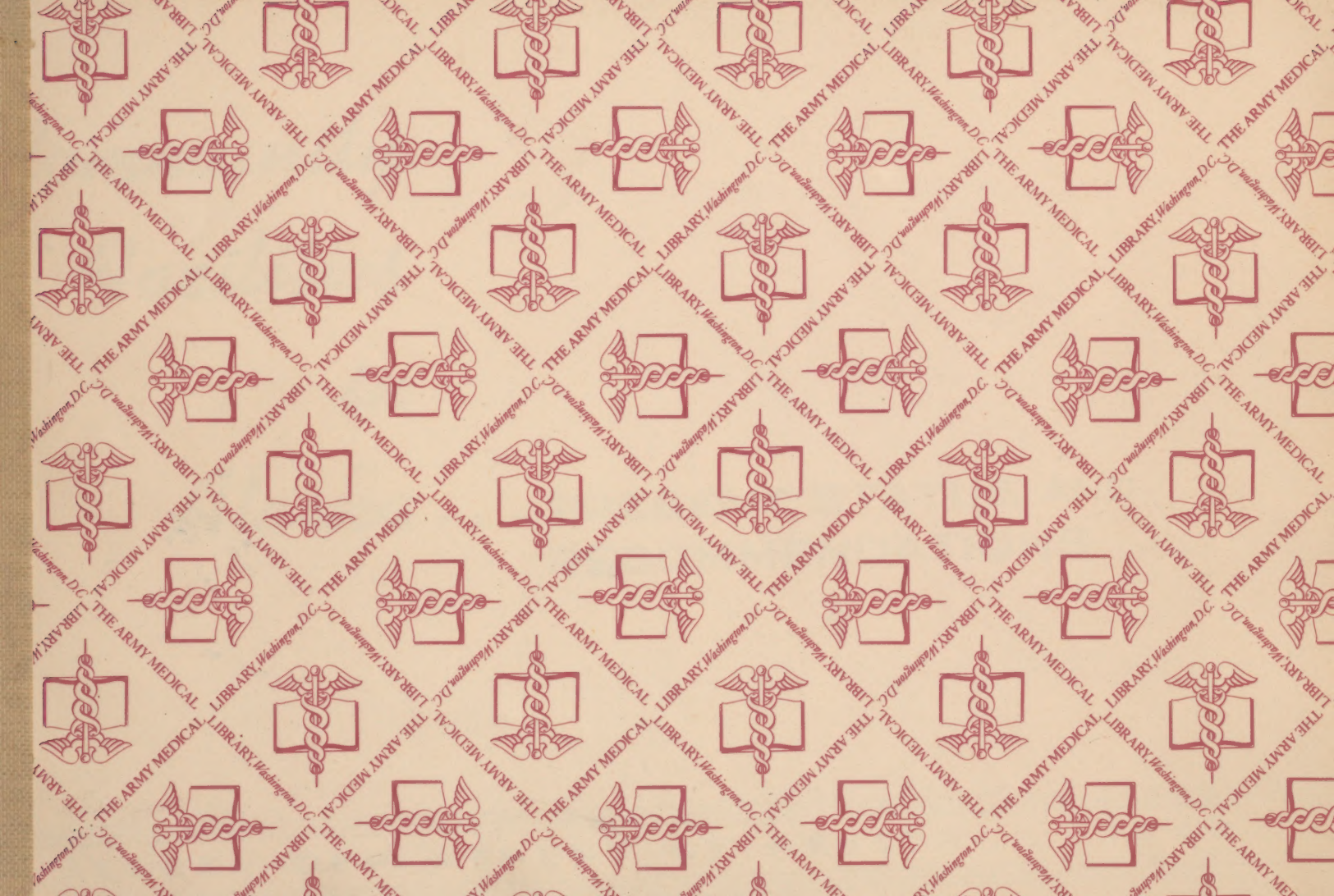


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*Community
Facilities
in*

Alaska . . . **PRESENT STATUS AND
RECOMMENDATIONS**



Figure 1

About 60% of Alaska is underlaid by permanently frozen ground (permafrost) In the most northerly sections this permafrost often extends to a depth of several hundred feet.

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Introduction

The present status of community facilities in Alaska, especially as concerns water supplies and sewage disposal systems, can be summarized in a single statement: Adequate community facilities do not exist anywhere in the Territory of Alaska.

The four particular types of community facilities discussed in this report—namely, water supplies, waste disposal systems, health centers and hospitals—are basic elements in the development of an adequate and healthful environment. Unless such facilities and their services are planned and provided according to minimum standards established to fit the particular needs, both current and future, of Alaskan communities, the present haphazard growth of the Territory with its concomitant risks to health, safety and comfort will continue as before. It is a sad and revealing commentary on the present situation in Alaska when departing visitors and residents express the feeling that at last they are “going back to civilization.” It is difficult to determine which is cause and which effect—are Alaskans willing to put up with things as they are because they feel their stay is temporary? Or, are they unwilling to become more than transient residents because things are as they are?

It is safe to predict that stabilization of the population, and consequently of the economy of Alaska, will come only when potential residents can be assured of community environments which compare favorably with those of communities in the States. While it is true that many communities in the States still do not possess adequate sanitary and other health facilities, it will be noted that these communities do not attract population groups seeking permanent locations. In order to attract permanent, homeseeking settlers to Alaska, the Territory must be able to offer both opportunities and environments which can compete successfully with the attractions available in the States. As a “frontier country,” Alaska has undeniable romantic appeal for individuals in search of adventure who may or may not become stable citizens. However, the practical business man, the investor and the average citizen in search of a permanent home are generally not willing to accept the present make-shift, inadequate type of housing and community structure as a favorable location for setting up a business, a family or an industry.

Improvement of existing conditions in Alaska is by no means a simple problem. The mere provision of a sufficient number of feet of sewer pipes, the construc-

tion of a number of filtration or other water treatment plants of the latest type, or the erection of modern health center or hospital facilities, will be of little value unless the improvements and new construction are planned and designed specifically to fit the needs of Alaskan communities. There is, for example, no ready answer as yet to the problem of providing adequate water supplies for communities in Arctic areas at reasonable cost where permafrost conditions render the use of accepted methods impractical. Many of the needed improvements will necessarily have to wait until preliminary research and experimentation can be carried out and satisfactory solutions found for many of the present problems. There are, however, a number of "sore spots" in the sub-Arctic which can and should be taken care of immediately, provided sufficient funds are made available.

The analysis of the current status of community facilities in Alaska is relatively simple; a facility is either adequate or inadequate according to accepted standards. But a true evaluation of needs must take into account future as well as current demands. To design or make improvements in a water supply and distribution system for a community such as Anchorage, the planner

must take into account the future probable growth as well as the immediate needs of the community.

Estimating population growth in Alaska is a risky business. There has been no official census in Alaska since 1940, just prior to the start of the Territory's period of phenomenal growth. For example, Anchorage in 1940 was listed as having a population of 3,495. Current estimates place the present population of Anchorage at somewhere between 20,000 and 35,000, with 20,000 a conservative minimum. The major population centers in the Territory have all experienced marked growth in the past eight years. No one can safely predict the future rate of growth of these same communities, although some planners go so far as to predict that Alaska will eventually have a population of ten million persons.

The adequacy of existing facilities as described in this report, is, of necessity, measured in terms of existing populations. Recommendations for needed improvements and new construction are based on an anticipated reasonable rate of growth, with an expected 5 to 10 per cent increase over a period of 10 years. Although it is quite possible that actual growth will considerably exceed this suggested rate, it is felt that for sound planning, expectations must be kept within reasonable limits.

As far as health center and hospital needs are concerned, similar allowances must be made for population growth and increased needs. In general, however, the need for such facilities and their probable locations can be estimated according to the pattern of growth already established. Areas which are destined to become medical centers are usually those which attract the greatest number of persons. These areas have been fairly well defined in Alaska.

PURPOSE OF REPORT

This report has been prepared for the specific purpose of presenting an up-to-date review of the status of certain existing community facilities and to summarize the need for additional construction and improvements, indicating current estimated costs of proposed facilities or additions.

The information contained in the report has been gathered and compiled within Alaska from reports of first-hand observations by special consultants in sanitation, engineering, hospital and health center construction, and from data available from the files and records of the Division of Sanitation and Engineering, the Division of Public Health Nursing and the Hospital Survey and Construction Unit of the Alaska Department of Health.

SCOPE OF REPORT

Although **all** community facilities have a direct or indirect bearing on the maintenance of a healthy environment, the scope of the present report is specifically limited to those particular facilities which are of immediate concern to the Alaska Department of Health; namely, facilities for the collection, protection and distribution of domestic water supplies; facilities for the collection and disposal of sewage and other wastes; health center facilities for rendering local community health services; and hospital facilities for the care of the sick and injured in the community.

It is both unnecessary and impossible to discuss in detail the present status and needs of each of the 481 communities which are included within the Territory of Alaska. The population of the majority of these communities is so small that there is no likelihood that they will require or be financially able to maintain community facilities within the near future. Since it is a generally accepted principle that a population of at least 200 persons is the smallest unit which can satisfactorily maintain and operate a community water supply or waste disposal system, this figure has been used as a base line in selecting the communities to be included in the survey of existing sanitary facilities and in determining future needs.

DEFINITION OF TERMS

For the purpose of this report, the term "public water supply" includes any water supply which is available to the public or which serves 25 or more persons, whether publicly or privately owned. Therefore, any supply serving an office building, dwelling, school, road-house or other establishment which furnishes water for 25 persons is defined as a "public water supply." Similarly, a well or pump used by a number of families is also classified as a public water supply if the members of the several families number 25 or more.

Any and every sewage disposal facility in a community is a potential health hazard to that community, regardless of the number of people served. A single privy on private premises can, if maintained in an unsanitary condition, constitute a public health menace. Thus, in judging the adequacy of the sewage disposal facilities of a given community, it is necessary to take into consideration every method which is used for sewage collection and disposal within that community. Accordingly, no system of sewage disposal in any Alaskan community can be said to be entirely satisfactory since there are practically none of them which do not include private facilities which are invariably in a sad state of sanitation. Even in those towns which have community

collection systems, many dwellings and even business establishments, although equipped with necessary plumbing fixtures, are not connected with the community system, relying on private cesspools or sewers for waste disposal.

The term "Health Center" is used in the present report to describe any facility which serves as a center for public health activities in a given community or area. This facility provides both clinic and office space for such public health personnel as may be stationed in the community or area. Health center facilities in isolated areas must include living quarters for the nurse and for itinerant physicians. Ideally, they should also include two beds for treatment of out-patients by visiting physicians. These beds are **not** intended for maternity care or for isolation, but rather for rapid treatment of venereal disease patients or other short term treatments. The size of the facility should naturally be determined by the number of people served. In Alaska, however, it has often been necessary to make use of whatever building or space was available regardless of size or suitability, and to fit the program to the available space.

There are many definitions of the word "hospital," but for present purposes a hospital is defined as a facil-

ity which provides bed care for ill and/or injured persons, including both long and short term illnesses. Both general and special facilities, such as tuberculosis and orthopedic hospitals, are covered by this report.

SUMMARY OF RECOMMENDATIONS AND COST ESTIMATES OF COMMUNITY FACILITIES IN ALASKA

	Number of New Facilities Recommended	Number of Expansions or Improvements of Existing Facilities Recommended	Estimated Costs— New Construction and Improvements
Waste Disposal Facilities	38	20	\$ 8,111,662
Water Supply Facilities	29	29	11,456,930
Hospital Facilities ¹	9	6	9,100,000
Health Center Facilities	30	3	1,509,500
Totals	106	58	\$30,178,092

¹Exclusive of Federal (Gov.) Facilities.

Summary of Existing Sanitary Facilities in Alaskan Communities of 200 and Over Population

WASTE DISPOSAL FACILITIES

There are fifty-eight communities in Alaska of 200 or over population; none of these fifty-eight communities have completely satisfactory waste disposal facilities.

Of the fifty-eight communities--

- 5 have community sewage disposal systems, all of which are in need of some improvements, replacements or extensions.
- 8 have partial community systems, supplemented by private facilities.
- 45 have no community sewage disposal facilities and rely entirely on private sewers, cesspools and privies.

The four largest towns and cities in Alaska, ranging from 7,000 to 20,000 population, include large sections (with both commercial establishments and private dwellings) served only by private facilities.

Of the 13 communities having partial or entire com-



This sewer outfall in Cordova, Alaska, is typical of many to be found in coastal towns throughout Alaska. Such outfalls should be extended to a point below the low tide mark.

munity systems, all discharge the sewage into tidal estuaries and rivers without treatment. Two of these systems were originally provided with treatment facilities, consisting only of settling tanks, but neither of these plants is being used currently because of the tremendous operating costs.

At the present time, sewage disposal facilities in the entire Territory can be said to be only 10 per cent adequate, chiefly for the following reasons:

Many of the existing community systems are equipped with old wood stave pipes, wooden box sewers and other worn out or outmoded equipment.

In several instances, the sewer outfalls are inadequate in length and size, or unsuitably located.

Nearly all of the existing systems serve only limited sections of the community and should be extended to include all business and residential areas within or immediately adjacent to the corporate limits of the town or city.

Community sewage disposal facilities which exist in towns located within the permafrost area are frequently put out of commission by freezing because of faulty design, location or construction of equipment.

Community systems are badly needed in many of the

fast-growing communities, now completely dependent on private facilities. In many instances, private sewers, cesspools or privies are located without regard to their proximity to private or public water supplies. As congestion increases in these areas, the actual and potential contamination of water supplies will increase. This hazardous situation will continue to exist until community sewage disposal systems have been installed.



"Privy Town," outskirts of Anchorage, Alaska. Typical concentration of "sanitary" facilities in rapidly growing residential section within city limits.

WATER SUPPLIES

There are 336 public water supplies on record in the files of the Alaska Department of Health. Many of these supplies are serving individual schools, roadhouses and other establishments.

Sixty-three of the 336 supplies are located in communities of 200 and over population. These 63 supplies, according to recent bacteriological tests, are classified as follows:

Satisfactory	10
Questionable	46
Unsatisfactory	7

Forty-three of the 63 public supplies are derived from surface water sources, 15 from ground sources and 5 from combined surface and ground sources.

Eleven of the 63 existing public water supplies receive some form of treatment, chiefly chlorination alone. The remaining 52 public supplies receive no treatment of any kind.

Of the 34 piped supplies, none is adequate from the point of view of equipment, extent of piping and capacity of source during various seasons. The remaining 29 supplies are individually obtained from wells, rivers, melted ice and so forth.

In a number of communities, water intakes, private

wells and cisterns are located in close proximity to actual or potential sources of contamination, such as privies, cesspools and sewer outfalls.



Open wells, such as this one located near the center of Alaska's largest city, are customary sources of water in many communities throughout the Territory.



During the winter freeze-up, October to May, residents of Nome, Alaska, have their water supply delivered to the door by trucks such as this one.

Several communities, located within the permafrost area, find it necessary to maintain two separate water supplies: one for domestic use, usually distributed by truck from door to door; another for fire fighting and other non-domestic purposes, distributed through pipes laid along the surface of the ground, which can be utilized in summer only. The water distributed by truck is usually taken from wells which are tested at intervals, but there is no control over possible contamination between the time the water leaves the well and the time it reaches the consumer. Protection of hoses, nozzles and other equipment used in door-to-door distribution depends entirely on the operator of the service.

In most of the larger growing centers of population where community distribution systems do exist, they supply only a portion of the existing population. Few of these communities planned their original facilities

on the basis of future growth; most of them have, therefore, been out-grown for many years.



Figure 2

Summary of Existing Hospital and Health Center Facilities in Alaska

Hospital Facilities

There are 24 hospitals now serving the estimated 94,875¹ civilian population of Alaska. The 25th is nearing completion at Nome.

Twenty-two, including the new facility, are general hospitals ranging in size from 8 to 83 beds; two are Tuberculosis Sanatoriums of 156 and 130 beds; and one is a 65-bed Orthopedic Hospital. The location, type, ownership and size of each hospital is shown in Table C.

The total number of available hospital beds in each category includes:

General	702
Tuberculosis	286
Orthopedic	65

Alaska has no beds for mental patients or chronic disease patients, and no facilities for isolation of communicable diseases other than tuberculosis.

Many of the existing hospital beds are housed in buildings which are completely unsuited for use as hospitals. Many of the structures are ancient fire traps

of log or wood frame construction. Several were formerly schools, apartment houses, private dwellings, Federal jails, orphanages, Masonic temples, or American Legion halls.

According to the standards established under the Hospital Survey and Construction Program, 78% of the beds in the 14 general hospitals operated by church or



Hudson Stuck Memorial Hospital, Fort Yukon, Alaska. Only hospital serving large section of Interior. Totally inadequate for present needs.

¹Estimate by Alaska Development Board, Sept. 1948.

other non-governmental agencies have been declared non-acceptable because of the physical condition of the buildings in which they are located.

Many isolated villages, which have too small a year-round population to afford a hospital, often have a seasonal influx of one to two thousand workers, creating acute problems regarding hospitalization of sick and injured workers. Gold mining, logging, fishing, cannery operations and highway and railroad construction are all seasonal occupations which cause yearly fluctuations in population. Many communities experience a considerable influx of tourists on an increasing scale. Several of the coastal towns, particularly Nome, are expected to provide hospitalization for ivory carvers from King and St. Lawrence Islands.

Many small communities are dependent on the hospital facilities of the nearest large town for care of their sick and injured. Some of these communities are frequently completely cut off during the winter months. Transportation of patients to the nearest facility often involves miles of expensive time-consuming and often dangerous travel.

The usual formula for determining hospital bed needs on a population basis is not applicable in Alaska because

of the wide dispersion of the population in numerous small isolated communities.

Additional beds are badly needed in all categories, but especially for mental illness and tuberculosis. Eighty additional beds have been authorized in quonset hut additions to four existing government hospitals; four hundred of the 500 beds authorized at Anchorage in the proposed government hospital will be used for tuberculosis hospitalization. The 480 additional



Providence Hospital, Anchorage, Alaska. Completed in 1939. (76 beds.) Inadequate for present and future needs.

authorized beds plus the 286 existing tuberculosis beds will provide a total of 766 beds which falls far short of the 1,000 tuberculosis beds recommended by experts as the minimum number needed in Alaska immediately.¹

All mental patients in the Territory must be sent to Morningside Hospital in Portland, Oregon, approximately 1,200 miles from Juneau. There are currently 335 Alaskan patients at Morningside. The average annual census of patients from Alaska is approximately 350. The care of these patients, excluding the costs of transportation to Portland, amounts to approximately \$480,648 annually.

To date, only one community has been financially able to raise the funds required for matching, two to one, the Federal allotments provided under the Hospital Survey and Construction Program. It is unlikely that many of the communities in most acute need of new facilities or expansion of existing hospitals will be able to finance their construction without Federal and Territorial assistance.

Health Center Facilities

There are 21 Health Centers and two auxiliary facilities in Alaska. With a single exception, all 23 facilities

¹AMA Reports 1947, 1948.

are located in structures completely separated and often at some distance from the existing hospital. At least 14 other communities and areas badly need health center facilities.

Most of the existing Centers are housed in buildings which were originally constructed and are still being used principally for other purposes. With few exceptions, the majority of the Centers are located on the second floors of old frame buildings, shared by other



Health Center, Naknek, Alaska. Houses both health center facility and living quarters for public health nurse. Inadequate to meet present needs.

community facilities such as fire departments, town libraries, shops and so forth. Most of the buildings are crowded, in poor physical condition, with steep, narrow stairways which make it difficult for pregnant mothers and those with young children to attend clinics and classes.

Several of the Centers have no running water or toilet facilities, and must either share these in other parts of the building, or use makeshift arrangements.

Three of the Centers are in buildings which were built 33 to 37 years ago, and which have served in the past as schools, stores, or living quarters. A number of the Centers are in "condemned" or abandoned Alaska Native Service installations.

None of the existing Centers, including those most recently constructed, have adequate space for current needs and all of them will obviously be even more cramped for space as the communities grow.

It is recommended that, wherever possible, new health center facilities be built as units of local general hospitals, either existing or proposed. It is felt that most Alaskan communities will benefit, both financially and physically, by provision of a combined facility of this type. The new hospital now under construction at Nome is the first combined facility in Alaska.

In communities which need health centers and where there is little likelihood that the existing hospital will be replaced in the near future, it is recommended that the proposed health center be attached, or at least adjacent to the existing hospital.

The construction of separate health center facilities is recommended for those communities in which the size of the community and/or the location of the existing hospital precludes the construction of a health center as part of the facility.



Community Health Center, Anchorage, Alaska. One of the newest and most modern facilities in Alaska, already outgrown by rapidly expanding community.

TABLE A

ANALYSIS OF EXISTING SEWAGE DISPOSAL FACILITIES IN COMMUNITIES OF 200 AND OVER POPULATION ALASKA, 1949

Community—	Population ¹	PRESENT METHODS AND FACILITIES		COMMENTS AND RECOMMENDATIONS ²
		Method of Collection	Means of Disposal	
Akiak (Permafrost)	209	No public system.	Individual collection and dumping of waste into river or on ground surface.	Construct community sewer system.
Anchorage	20,000*	Public sewer system, privies and private facilities.	Public system discharges into Cook Inlet, untreated. Private facilities discharge on surface.	Public system serves only part of city. Should be extended to serve all of city proper and as much of outskirts as possible. Storm sewers needed. Privies and other private facilities generally in bad shape—considerable improvement needed.
Angoon	342	No public system.	Privies and water flush toilets discharging directly to beach.	Construct community sewer system.
Barrow (Permafrost)	750*	No public system. Few (2) privies. Chemical toilets at Govt. Bldgs. Slop jars. Many sod huts without conventional means of waste collection.	Individual families empty slop jars into oil drums which are dragged onto ice in bay to be carried off in Spring breakup. Hit or miss system of collection. Families without facilities use adjacent surface area.	Organized scavenger service for placing and collecting oil drums or other receptacles badly needed. Some one person or persons should be instructed, paid and made responsible. Long term investigation needed to further develop safe, economical and practical methods of disposal for permafrost areas. Reports of gastro-intestinal disturbances frequent—no evidence of source.
Bethel (Permafrost)	450*	No public system.	Individual collection and dumping of waste into river, on ice or on ground surface.	Wastes deposited on ice in river and carried ashore during Spring breakup. Gastro intestinal outbreaks common during this period. Public system would require provision of heat to prevent freezing. Recommended that new waste disposal system (with provision for heat) be provided.
Chignik	224	No public system.	Individual collection and dumping.	Construct community sewer system.
Chilkoot Barracks	337	Community sewer system.	Discharged to tide water.	Rehabilitate and extend system.
College (Permafrost)	234	No public system. University has own collection system and septic tank.	Privies and cesspools in village.	Insanitary conditions due to poor drainage because of character of soil and existence of permafrost. Construct community sewer system.

¹Estimated Population (1948).²Provision of community sewer system will necessarily depend on the availability of a community water system.

TABLE A—(Continued)

Community—	Population ¹	PRESENT METHODS AND FACILITIES		COMMENTS AND RECOMMENDATIONS ²
		Method of Collection	Means of Disposal	
Cordova	1,500*	Public sewer system. Private sewers. Privies.	Sewer outfalls empty above low tide mark. Private sewers discharge untreated into small streams. Insanitary type privy.	Outfalls should be extended below low tide mark to prevent pollution of beach area. Rehabilitate and extend sewer system.
Craig	500*	No public system. 25% flush toilets and private sewers. 75% cesspools and privies.	Private sewers empty on beach above low tide mark.	Private sewers in poor repair. Construct community sewer system.
Deering (Permafrost)	230	No public system.	Individual collection and dumping of wastes.	Construct sewer system.
Dillingham	450*	No public system. Private means of collection.	Private disposal by privies and dumping on ground surface.	Construct sewer system.
Douglas	525*	Public system serves large proportion of town. Some private sewers; some privies.	Discharge below low tide mark into channel. Private sewers discharge chiefly on to beach above low tide mark. Some privies located over beach.	Extend public sewers to all parts of community.
Eyak	365	No public system. Cesspools and privies.	Individual collection and dumping.	Construct sewer system.
Fairbanks (Permafrost)	8,500*	Public sewer system in center of town. Much of residential area served by septic tanks or cesspools.	Sewage discharged untreated into Chena River.	System constructed 1938-39 for domestic sewage only. Storm sewers connected later. System now inadequate for growing city. System improperly constructed—low grades permit easy freezing, back flow. Serves only limited section of city. Difficult and expensive to operate (Operating costs winter 1947—\$40,000). Rehabilitate and extend system.
Fort Yukon (Permafrost)	500*	No public system.	Private disposal. Chiefly insanitary privies, and individual collection and dumping.	Construct sewer system.
Gambell (Permafrost)	296	No public system. No privies—slop buckets used.	Buckets are dumped into ocean or on ice.	Construct sewer system.
Haines	400*	Inadequate system. Privies and cesspools.	Sewage discharges into open drainage ditches.	Clay subsoil does not permit proper drainage. Frequent failure of water supply interferes with sewage disposal. Rehabilitate and extend sewer system.

TABLE A—(Continued)

Community—	Population ¹	PRESENT METHODS AND FACILITIES		COMMENTS AND RECOMMENDATIONS ²	
		Method of Collection	Means of Disposal		
Holy Cross (Permafrost)	226	No community system.	Individual collection and dumping.	Construct sewer system.	
Homer	325*	Privies, open ditches, septic tanks. (Private sewers—hotels and schools.)	Sewage drains down slope into Cook Inlet.	Construct sewer system.	
Hoonah	716	Community system. Few private sewers and privies. School has septic tank and emergency sewer to beach.	Outfall on beach for community system, which does not extend throughout village.	Only one outfall for entire community, located above low tide mark. Extend sewers.	
Hooper Bay (Permafrost)	323*	No outhouses or other apparent means of disposal. Village 2/3 sod houses.	Chemical toilets at school.	Construct sewer system.	
Hydaburg	348	Privies; few private sewers.	Deposit on beach or drainage into soil.	Construct sewer system.	
Juneau	7,000*	Community sewers. Private sewers. Some houses with sewers not connected to community system. Some native homes without any facilities. Privies.	Community sewer discharges into tidal estuary. Sewage from houses not connected seeps into soil. Homes without facilities dump on flats or carry to beach.	Entirely inadequate in many sections. Extend and repairs sewers—connect dwellings to existing sewers.	
Kake	419	No community system. Privies. Few sanitary toilets.	Sewers empty on beach.	Construct sewer system.	
Kenai	393	Pit privies, or surface of ground.	Poor construction. Not repaired. Generally insanitary.	Construct sewer system.	
Ketchikan	7,000*	Municipal sewers. Many private sewers. Some establishments discharge directly on to beach.	Some sewage discharged into creek running through town. 235 outfalls into Ketchikan Creek—important spawning stream. Creek flows through densely populated area. Other sewers discharge above low tide mark on beach.	Inadequate disposal. Extend sewers to point below low tide line. Frequent reports of gastro-intestinal disturbances in past. Rehabilitate and extend system.	
King Island (Permafrost)	208	Individual collection—	and disposal.	Construct sewer system.	

TABLE A—(Continued)

Community—	Population ¹	PRESENT METHODS AND FACILITIES		COMMENTS AND RECOMMENDATIONS ²
		Method of Collection	Means of Disposal	
Klawock	455	No public system. 90% privies, 10% private sewer lines—most in bad condition. Privies in poor sanitary condition.	Sewers empty directly on beach. Privies a menace.	Construction of community sewer system recommended.
Kodiak	1,200*	Limited system some privies, cesspools, septic tanks, 70-80% of town served.	Sewage dumped into bay above low tide. Privies and private facilities not satisfactory because of soil (bedrock).	Community sewer system should be extended and improved.
Kotzebue (Permafrost)	400* (Summer population approx. 1,000)	No plumbing or sewers. Chemical toilets in some homes. Deposit of waste on surface common.	Chemical toilets dumped into oil cans and hauled onto ice. No organized system of collection.	Construct community sewer system.
Kwinhagak	224	Individual collection—	and disposal.	Construct community sewer system.
Metlakatla	674	Village sewerod.	Flows into Bay.	Rehabilitate and extend sewer system.
Nenana (Permafrost)	250*	2 sewer lines. Limited capacity. Pit privies.	Empties into Tanana River. Privies poorly constructed and ill-kept. Sewer system inadequate.	Rehabilitate and extend sewer system.
Noatak (Permafrost)	336	Individual collection—	and disposal.	Construct sewer system.
Nome (Permafrost)	1,600*	Box and can. Few cesspools along beach.	Scavenger service. Dump waste on frozen beach. Motor truck used with heated tank and hot water for flushing cans.	Construct sewer system.
Noorvik (Permafrost)	211	Individual collection—	and disposal.	Construct sewer system.
Ouzinkie	253	Private open privies.	Surface disposal.	Construct sewer system.
Palmer	1,500*	Public sewer system.	2 outfalls into river.	Extend sewer system.
Petersburg	1,500*	Community system serves most of city—few privies or cesspools.		Existing wood box sewers need replacing. System should be extended to serve entire community.

TABLE A—(Continued)

Community—	Population ¹	PRESENT METHODS AND FACILITIES		COMMENTS AND RECOMMENDATIONS ²
		Method of Collection	Means of Disposal	
Rampart (Permafrost)	200*	No community system. Individual collection—	and disposal.	Construct sewer system.
St. Paul Island	299	Community system.		Completely Government owned and controlled system.
Savoonga (Permafrost)	209	No privies slop buckets.	Dumped at mouth of river.	Construct community sewer system.
Selawick (Permafrost)	239	No community system. Individual collection—	and disposal.	Construct community sewer system.
Seldovia	400*	No public system. Private sewers. Privies.	Sewers discharge on beach.	Important fishing center influx of workmen in summer. Construct community sewer system.
Seward	1,000*	90% town sewered. Wooden pipes, few septic tanks and cesspools.	5 outfalls into Resurrection Bay above low tide mark.	Gastro-intestinal disturbances reported. Pipes and wooden box sewers need replacing. Outfalls should be extended—privies need overhauling.
Shishmaref (Permafrost)	257	Mostly deposited on surface. Some can toilets.	Dumped on surface.	Construct community sewer system.
Sitka	2,000*	Public system serving most of town. Few privies and private sewers.	Discharge into tide water. Privies and private sewers outside corporate limits mostly.	Outfalls in poor condition should be extended. New outfalls needed to divert discharge from area to be developed.
Skagway	650*	Sewer system, private sewers, septic tanks, some cesspools, privies.	Empties into Lynn Canal above low tide.	Extend system.
Tanana (Permafrost)	300*	Individual collection—Privies. Hospital has sewers and septic tank.	and disposal. Hospital sewer discharges into Yukon River.	Construct community sewer system.
Tigara (Permafrost)	257	Box and can system. Individual collection—	and disposal.	Construct community system.
Unalakleet (Permafrost)	329	No community system.	Government installation has septic tank and cesspool. Other collection and disposal individual proposition.	Construct sewer system.
Unalaska	600*	No community system. Private sewers; privies.	Discharges directly into bay or river, or cesspools. Sewage accumulates on beach. Privies unsatisfactory. Sewer outfall from hospital empties below low tide.	Construct community sewer system.

TABLE A—(Continued)

Community—	Population ¹	PRESENT METHODS AND FACILITIES		COMMENTS AND RECOMMENDATIONS ²
		Method of Collection	Means of Disposal	
Valdez	600*	No community system.	Sewers empty into 3 small streams running through town, or into cesspools.	Unsatisfactory—much sewage discharges into water table which is only 1-2 feet below ground level. Construct community sewer system.
Wainwright (Permafrost)	341	No community system.	Individual collection and disposal with slop buckets.	Construct community sewer system.
Wasilla	200*	Privies and cesspools.	Seepage pits.	Cesspools and privies located too near wells. Construct community sewer system.
Wrangell	1,200*	Public sewer system; private sewers; privies; cesspools; some without any facilities.	Wood box sewers. Private sewers discharge directly on to beach above low tide.	Generally unsatisfactory condition—wood box sewers broken and leaking. Rehabilitate and extend sewer system.
Yakutat	292	Privies or no facilities.	Pit or surface disposal. Mostly insanitary open privies. Cesspools at school, hospital and cannery.	Construct community sewer system.

TABLE B

ANALYSIS OF EXISTING WATER SUPPLY FACILITIES IN COMMUNITIES OF 200 AND OVER POPULATION
ALASKA, 1949

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Akiak (Permafrost) ³	209	Surface	None	None	Questionable	No piped supply. Private sources or Kusko- kwim River water used. Community supply should be provided by developing source and constructing treatment and distribu- tion facilities.
Anchorage	20,000*	Surface	60% of present popula- tion served. Present mains insufficient in number and size.	Chlor.	Satisfactory	Present source subject to contamination. Distribution system inadequate. Develop new source, intake works, transmission lines, provide treatment and rehabilitate distribution system.
Angoon	342	Surface	2 outlets in buildings. 4 public faucets. 4 hydrants.	None	Questionable	Present source—drainage from muskeg swamp, inadequate and unprotected. Addi- tional or new source should be developed, water treatment provided and distribution system extended.
Barrow (Permafrost)	750*	Surface	None	None	Questionable	No piped supply. Hauled from lake in bar- rels in summer. Ice melted in winter. De- velop adequate source, provide treatment facilities and construct distribution system suitable for use in permafrost. (Perma- frost 900 feet deep.)
Bethel (Permafrost)	450*	Surface	None	None	Questionable	No piped supply. Community dependent on river, tundra lakes, rainwater and melted ice. Develop adequate and safe source, pro- vide treatment and distribution facilities suitable for use in permafrost.
Chignik	224	Ground	None—save for can- nery (private) supply.	None	Questionable	No piped supply. Private unprotected wells. Yearly outbreaks of gastro-intestinal dis- turbances reported. Develop more adequate community source, provide treatment facili- ties and distribution system.

¹Unless starred (*), population figures are as of 1940 census. Starred figures indicate estimates as of 1948.²Bacteriology quality is indicated as "satisfactory," "questionable" or "unsatisfactory" in accordance with U.S.P.H.S. drinking water standards.³Communities with permafrost problems so indicated.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Chilkoot Barracks	337	Surface	Limited distribution system.	Chlor.	Questionable	Lake source, watershed open to trespass. Provide emergency ground water source, treatment facilities, and extend distribution system.
College (Permafrost)	234	Ground	None save at University of Alaska.	None	Questionable	No piped supply for community. Shallow wells along Jenny M. River subject to contamination. Develop community source, provide treatment and distribution system.
Cordova	1,500*	Surface	Mains inadequate in number and size.	None	Satisfactory	Reservoir not adequate year round. Develop additional supply, provide treatment and rehabilitate distribution system.
Craig	500*	Surface	Pipe line poorly constructed. Subject to freezing. Not adequate to supply entire village.	None	Unsatisfactory	Present storage capacity inadequate when canneries are operating. Supply often fails during dry or freezing weather. Develop additional source, provide treatment, rehabilitate and extend distribution system.
Deering (Permafrost)	230	Surface	None	None	Questionable	No piped supply. Individual families get own supplies from creek, melted ice, and so forth. Develop source, provide treatment and distribution facilities suitable for permafrost area.
Dillingham	450*	Surface and Ground	None	None	Questionable	No piped supply. Natural springs and shallow wells used as source. Typhoid reported 1948. Develop community source and provide treatment and distribution facilities.
Douglas	525*	Surface	Mains extend to only part of community.	Chlor.	Unsatisfactory	Unprotected surface source; dwellings, ski and foot trails on watershed. Frequent laboratory reports of contamination. Chlorination carried on irregularly. Further development of source and additional treatment and distribution facilities necessary.
Eyak	365	Surface	None	None	Questionable	No piped supply. Sources subject to contamination. Develop source and provide treatment and distribution facilities.
Fairbanks (Permafrost)	8,500*	Ground	Limited piped supply in business district, private wells, bottled water or tank truck delivery to door.	None	Questionable	No piped supply for domestic use. Bottled water and water distributed by truck tested at source. No possible control over potential avenues of contamination during delivery to consumer. Develop community source, provide treatment and distribution facilities suitable for use in permafrost.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Fort Yukon (Permafrost)	500*	Surface	None	None	Questionable	No piped supply. Water obtained from river, subject to contamination. Develop safe community source, provide treatment and distribution facilities suitable for use in permafrost.
Gambell (Permafrost)	296	Surface and Ground	Partial piped supply, some wells, melted ice and snow.	None	Questionable	Lake formerly source of piped supply contaminated by sea water. Many families now using old condemned well and ice. Many cases of diarrhea reported. Develop source, provide treatment and distribution system suitable for use in permafrost.
Haines	409*	Surface	Old wooden pipes in need of constant repair. Piping not adequate.	None	Unsatisfactory	Present supply entirely inadequate—obtained from creek and muskeg swamp. Subject to contamination and frequent failure. Develop source, provide treatment, rehabilitate and extend distribution system.
Holy Cross (Permafrost)	226	Surface	None	None	Questionable	No piped supply. Doubtful private sources used—chiefly river. Develop community source, provide treatment and distribution facilities suitable for use in permafrost.
Homer	325*	Surface	None	None	Questionable	No piped supply. Water hauled by bucket through hole in ice on creek; several “unimproved” privies on creek. Some dug wells. Cases of “stomach flu” reported at intervals. Develop community source, provide treatment and distribution facilities.
Hoonah	716	Surface	$\frac{3}{4}$ of community served by piped supply.	None	Questionable	Supply reported as fairly adequate although subject to contamination. Gastro-intestinal disturbances reported—water suspected. Develop emergency ground water source, provide treatment and extend distribution.
Hooper Bay (Permafrost)	325*	Surface	None	None	Questionable	No piped supply. Water obtained by bucket from small lake $\frac{1}{4}$ mile from village. Gastro-intestinal disturbances reported. Develop community source, provide treatment and distribution facilities suitable for use in permafrost.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Hydaburg	348	Surface	Limited piped supply; faulty piping.	None	Unsatisfactory	Supply uncertain. Many homes without water in winter. Typhoid and gastro-intestinal disturbances reported. Develop additional source, supply treatment and rehabilitate and extend distribution system.
Juneau	7,000 ²	1 Ground 3 Surface Supplies	4 different systems equipment old, some wood stave piping.	Chlor. (1) None (3)	Satisfactory (1) Questionable (3)	System does not service entire community. All supplies should be treated. Source should be augmented and improved, treatment provided and distribution system rehabilitated and extended.
Kake	419	Surface	Limited piped supply to part of village. Many families carry water by hand.	None	Questionable	Water taken from small creek—often goes dry in summer. Water unpalatable. Cannery near town has own supply—from larger more adequate source. Possible ground water sources nearer town. Develop better source, provide treatment facilities, rehabilitate and extend distribution system.
Kenai	303	Ground	None	None	Unsatisfactory	No piped supply. Shallow unprotected wells used chiefly. Cases of gastro-intestinal disturbances reported. Cannery has own supply. Develop source, provide treatment and distribution facilities.
Ketchikan	7,000 ²	Surface	System constructed in 1906. Wood stave mains. Poor repair.	None	Unsatisfactory	Recent sanitary surveys have shown gross pollution of water supply, chiefly from watershed, possibly from back siphonage where pipes are laid under piling and are covered at high tide. Expected power development will require expansion of distribution system. Watershed should be protected and treatment provided.
King Island (Permafrost)	208	Surface	None	None	Questionable	No piped supply. Melted ice and snow used without treatment greater part of year.
Klawock	455	Surface	Piped supply to some parts of village.	None	Unsatisfactory	Wood stave pipes—many in poor condition. Supply often fails in winter. Dam should be raised or better source located. Treatment facilities needed and distribution system should be rehabilitated and extended.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Kodiak	1,200*	Surface Ground	Municipal supply does not serve entire community. Some private wells used.	1 Chlor. 2 None	Satisfactory Questionable	Several small supplies in use—not considered safe. System freezes in winter. Develop better source. Distribution system should be extended to meet demands.
Kotzebue (Permafrost)	400* (Summer population, 1,000)	Ground and Surface	None	None	Questionable	No piped supply. Melted ice primary source. Thawed pools under buildings and a few dug wells. Gastro-intestinal disturbances reported, typhoid. Develop community source, provide treatment and distribution system suitable for use in permafrost. Suggest series of shallow wells—housed and locked pumps with attendant as immediate solution.
Kwinhagak	224	Surface	None	None	Questionable	No piped supply. Surface sources unsafe. Develop source, provide treatment and distribution facilities.
Metlakatla	674	Surface	Community owned system fairly adequate. Does not serve entire community.	None	Questionable	Reservoir in mountains—gravity flow. Treatment facilities should be provided and distribution system rehabilitated and expanded.
Nenana (Permafrost)	250*	Ground	Piped supply serves only railroad and docks. Rest of town uses wells.	Chlor. (Piped supply)	Questionable	Wells near Nenana River subject to contamination. Community source should be developed, treatment facilities augmented, and distribution facilities extended to serve entire community. (Typhoid reported 1947.)
Noatak (Permafrost)	336	Surface	None	None	Questionable	No piped supply. Water taken from Noatak River; ice melted in winter. Develop community source, provide treatment and distribution facilities.
Nome (Permafrost)	1,600*	Ground	Limited piped supply for use in summer. Bottled or tank truck source in winter.	None	Questionable	Possibility of year-round piped supply requires investigation. Wells tested but water may be contaminated before it reaches consumer by truck. Gastro-intestinal disturbances reported. Develop source, provide treatment and develop distribution system for use in permafrost.
Noorvik (Permafrost)	211	Surface	None	None	Questionable	No piped supply. Melted ice and snow used in winter. River water in summer. Develop source, provide disinfection and distribution facilities.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Ouzinkie	253	Ground	None	None	Questionable	No piped supply. Water obtained from shallow open wells by dip bucket. Improve wells, provide disinfection and distribution facilities.
Palmer	1,500*	Ground	Piped supply does not serve all homes.	None	Questionable	Original system expanded haphazardly—supply sometimes runs short in summer. Gastro-intestinal disturbances reported. Improve and supplement source, provide disinfection and extend and rehabilitate distribution system.
Petersburg	1,500*	Surface	Piping inadequate in size. Mains need replacing.	Chlor	Satisfactory	Present source inadequate as dam is in bad condition. Piping over 30 years old—only 6-inch diameter. New dam, intake works and supply line needed, also improved treatment facilities and minor distribution system repairs needed.
Rampart (Permafrost)	200*	Surface	None	None	Questionable	No piped supply. Melted ice and Yukon River water used. Develop better source (ground), provide disinfection and distribution system suitable for permafrost.
St. Paul Island	299	Surface	Piped to Government buildings and some Native homes.	None	Questionable	Piped supply limited—source not developed. Develop source, provide treatment and distribution system.
Savoonga (Permafrost)	209	Surface	Limited piped supply for non-drinking purposes.	None	Satisfactory	Piped supply obtained from river unsafe for drinking. Melted ice and snow also used. Improve source, supply treatment and extend distribution facilities suitable for use in permafrost.
Selawick (Permafrost)	239	Surface	None	None	Questionable	No piped supply. Water obtained from river by buckets. Melted snow and ice used. Develop better source, provide treatment and distribution facilities suitable for permafrost area.
Seldovia	400*	Surface	Limited piped supply.	None	Questionable	Supply subject to summer failure—source inadequate. Develop better source, provide treatment, rehabilitate and extend distribution system.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Seward	1,000*	Ground and Surface	Antiquated piping -- wood stave. Limited service.	None	Satisfactory	Private corporation--several sources used, not all suitable for domestic use. Pipes often freeze creating sanitary and fire hazards. Improve selected source, provide treatment, relay pipes deeper and/or re- habilitate and extend distribution system.
Shishmaref (Permafrost)	257	Surface	None	None	Questionable	No piped supply. Shallow ponds, ice and snow used. Develop source, provide treat- ment and establish distribution system suitable to permafrost area.
Sitka	2,000*	Surface	Piped supply. Few wells.	Chlor.	Satisfactory	Supply often runs low in mid-winter. Source will not be adequate if pulp mills are established. Wells unprotected. Extend distribution system and provide emergency source.
Skagway	650*	Surface	Piped supply serves most of town. Few wells.	Chlor.	Satisfactory	Watershed used as recreation area--possi- ble contamination. Need auxiliary ground sources for maintaining supply during cold weather. Extend and rehabilitate distribu- tion system. Provide additional facilities for treatment.
Tanana (Permafrost)	300*	Ground	None	None	Questionable	No piped supply. Water obtained from well near bank of Yukon River. Need distribu- tion system, additional source, and treat- ment facilities.
Tigara (Permafrost)	257	Surface	None	None	Questionable	No piped supply. Shallow surface pools, ice and snow. Need better source, treatment facilities and distribution system adapted to permafrost.
Unalakleet	329	Ground	None	Chlor.	Questionable	No piped supply. Well sources. Need distri- bution system and improved treatment methods.
Unalaska	600*	Surface	2 mains from reservoir to town; 2 wells.	None	Questionable	Reservoir inadequate for year round sup- ply. Gastro-intestinal disturbances reported. Develop additional source, extend and re- habilitate distribution system.

TABLE B—(Continued)

Community—	Popula- tion ¹	PRESENT SUPPLIES AND FACILITIES				COMMENTS AND RECOMMENDATIONS
		Source	Distribution System	Treatment	Bacteriological Quality ²	
Valdez	600*	Ground	None	None	Questionable	No piped supply. Individually owned wells and pumps. Provide more and protected wells, disinfection equipment and a distribution system.
Wainwright (Permafrost)	341	Surface	None	None	Questionable	No piped supply. Shallow surface pools, ice and snow used. Develop source, provide treatment and distribution system adapted to permafrost.
Wasilla	20*	Ground	None	None	Questionable	No piped supply. Community well, dip bucket extraction. Develop better source, provide treatment and distribution system.
Wrangell	1,200*	Surface	Ancient piping — re- quires constant repair.	None	Questionable	Replacement of dam imperative. Distribution system should be rehabilitated and extended. Emergency ground water source should be developed and elevated storage tanks provided. Treatment facilities should be supplied.
Yakutat	292	Ground and Surface	None	Chlor.	Satisfactory	No piped supply. Private supplies, springs, creeks and rain barrels. Develop community source, provide treatment facilities and distribution system.

TABLE C

ANALYSIS OF EXISTING HOSPITAL FACILITIES ALASKA, 1949

Community—	Population of Area	EXISTING FACILITIES			RECOMMENDATIONS		COMMENTS
		Type and Ownership ¹	No. of Beds	Description	New Facility	Expansion of Existing Facility	
Anchorage	20,000	Gen. (CH)	76	Opened 1939: Reinforced concrete, 3-story Inadequate for present or future demands.	500-bed (400-TB; 100 Gen.) Authorized by Fed. Gov. for 1949	Isolation Unit (25 beds) needed.	Existing facility too small for current demands. Proposed Government hospital will provide care for Natives only. Will relieve some of demand on Church hospital; expansion of existing facility necessary to meet future needs. Recommended 25-bed addition for isolation unit. New Government facility to provide hospital care for large section of Interior. Will relieve strain on existing hospital and provide more facilities for care of Native patients.
Barrow	2,387	Gen. (Gov.) ²	20	One story frame construction Inadequate for present or future needs		20-bed Quonset hut addition for TB isolation authorized. Dental office and field nurse's station to be included.	Inadequate for current demand. Addition of 20-bed isolation unit for TB will release original 20 beds for general care.
Bethel	2,608	Gen. (Gov.)	45	Two-story frame construction. Inadequate for present or future needs.		20-bed Quonset hut addition for TB isolation authorized Dental office and field nurse's station to be included	Original 45 beds will all be available for general care when 20-bed addition is completed.

¹Ownership indicated as follows:

CH—Church

Gov.—Government (Alaska Native Service, Dept. of Interior)

NPA—Non-Profit Association

Mun.—Municipal

Terr.—Territorial Government.

²Government owned hospitals are operated primarily for Native groups only. In communities where Government hospital is only one, it serves entire community; where additional hospitals exist, Government facility is restricted for Native use only.

TABLE C—(Continued)

Community—	Population of Area	EXISTING FACILITIES			RECOMMENDATIONS		COMMENTS
		Type and Ownership ¹	No. of Beds	Description	New Facility	Expansion of Existing Facility	
Cordova	2,351	Gen. (NPA)	23	Second floor of old apartment house; fire hazard; lease expires June, '49; no possibility of renewal. No funds.	New 35-bed hospital; 10-bed isolation unit for TB included.		New hospital badly needed. Present facility unsafe; to be abandoned. Big influx of fishermen and other seasonal workers causes critical need for beds each year.
Fairbanks	16,542	Gen. (CH)	51	Frame building, 3-story. Fire hazard. Opened 1910. No isolation space; totally inadequate.		40-bed addition with 20-bed isolation unit for TB.	Critical need for more beds in rapidly growing area. Addition of TB unit will free some beds for general care. Top priority.
Fort Yukon	800	Gen. (CH)	37	Log structure; fire hazard; space inadequate.	New 40-bed hospital with 20-bed isolation unit for TB.		Only hospital serving large area; totally inadequate for present or future needs.
Haines	1,301	NONE			New 25-bed hospital with 10-bed isolation unit for TB.		No hospital nearer than Skagway; frequently cut off during winter months; Skagway hospital available only for emergency care.
Juneau	9,046	Gen. (CH)	55	Present main structure opened 1933; 3-story non-fire resistive; open stairwells fire hazard. Wing added 1933; (reinforced concrete).			Bed space inadequate for present needs. Only room for expansion in present location is from frame structure. No immediate plans. Enlarging nurses' residence would release small number of beds.
		Gen. (Gov.)	48	Two-story frame construction. Space inadequate.	New facility—75 beds—(50 gen. 25 TB) scheduled for completion by 1952.		Present government hospital only general facility for Native population in Southeastern Alaska; larger facility needed to serve large section of Territory.

TABLE C—(Continued)

Community—	Population of Area	EXISTING FACILITIES			RECOMMENDATIONS		COMMENTS
		Type and Ownership ¹	No. of Beds	Description	New Facility	Expansion of Existing Facility	
Kanakanak	500	Gen. (Gov.)	37	2-story wooden building, 1 floor patients, 1 floor living quarters.		20-bed Quonset hut addition to existing facility authorized. Dental office and field nursing station (2 nurses) included.	Existing facility located 5 miles from community which it serves; road often cut off in winter.
Ketchikan	8,561	Gen. (CH)	83	Original building 3-story non-fire resistive. Opened 1923; space inadequate although wing added in 1943.		27-bed TB isolation unit needed.	Addition should be built on to wing added in 1943 (reinforced concrete).
Kodiak	4,064	Gen. (CH)	19	Opened 1939—Reinforced concrete. Inadequate space for area served.		21-bed addition for TB isolation to free Gen. beds.	Addition of another floor and allocation of 21 beds for TB isolation would release space.
Kotzebue	1,937	Gen. (Gov.)	21	Opened 1930; frame building; totally inadequate.	New 80-bed hospital—(40 gen. 40 TB); Dental office and field nursing station (2 nurses) included. Authorized.		Present hospital to be abandoned when new 80-bed hospital is completed. Expected to be completed in 1952.
Mt. Edgumbe	Special hospitals serving entire Territory	Ortho. (Gov.)	65	Opened 1947; reinforced concrete; converted Navy installation.		65-bed addition needed.	Present Orthopedic Hospital only one in Alaska. Inadequate to meet demands. Long waiting list.
		TB (Gov.)	156	Opened 1945; reinforced concrete; converted Navy installation.		200-bed addition under construction.	Present TB hospital one of two in Alaska; inadequate bed space; long waiting list.

TABLE C—(Continued)

Community—	Population of area	EXISTING FACILITIES			RECOMMENDATIONS		COMMENTS
		Type and Ownership ¹	No. of Beds	Description	New Facility	Expansion of Existing Facility	
Nome	5,503	— NONE —		Hospital burned in 1948. New general facility under construction with Hill-Burton funds.	34-bed Gen. (CH) Hospital scheduled for completion in 1949.		New facility first Alaskan hospital built under Hill-Burton Act. First to combine hospital and health center facilities.
Palmer	4,316	Gen. (NPA)	12	Hospital burned 1946. Present structure temporary and inadequate in space and design.	New 50-bed hospital, including 15 beds for TB isolation.		New hospital badly needed to replace present makeshift facility.
Petersburg	2,213	Gen. (Mun.)	9	Existing beds located in re-conditioned private dwelling; space and equipment inadequate.	25-bed hospital with 15-bed TB isolation unit.		
Seldovia	418	Gen. (Mun.)	8	Frame building, opened 1942— inadequate space.		17-bed addition—10 beds for TB isolation	
Seward	2,028	Gen. (CH)	30	Existing beds located in old school house; some patient rooms below ground level.	40-bed hospital; 10-bed isolation unit.		Existing facility makeshift—unsuitable and inadequate.
		TB (CH)	130	Opened 1946—converted Army installation.			One of two TB hospitals in Alaska—no immediate plans for future until isolation units in existing hospitals and addition to TB sanatorium at Mt. Edgecumbe are completed.
Sitka	Pioneers' Home serves entire Territory	Institutional (Terr.)	44	Institute for care of aged. Opened 1934.		Additional wing planned to house aged women residents.	Only facility for care of chronic cases among aged. Facilities for care of general chronic patients badly needed.

TABLE C—(Continued)

Community—	Population of area	EXISTING FACILITIES			RECOMMENDATIONS		COMMENTS
		Type and Ownership ¹	No. of Beds	Description	New Facility	Expansion of Existing Facility	
Sitka	3,581	NONE			50-bed general hospital with 10 beds for TB isolation unit. (Comm. or NPA.)		Nearest general hospital for Sitka residents is at Juneau. Emergency care only available at Pioneers' Home and Mt. Edgecumbe special hospitals.
Skagway	1,305	Gen. (NPA)	10	Opened 1904 for railroad personnel.			Operated primarily for employees of White Pass & Yukon Railroad; emergency care only for local residents. No plans for expansion.
St. Paul Island	482	Gen. (Gov.)	10				Government facility operated for Native personnel in Fur Seal industry on Pribilof Islands. No plans for expansion.
Tanana	300	Gen. (Gov.)	34	Present facility inadequate		20-bed addition to be completed in 1951.	Of total 54 beds, 24 will be for TB isolation. Dental office and nurses' station included.
Unalakleet	2,898	NONE			10-bed rural health center. (Gov.) Dental office and nurses station.		Combined facility recommended.
Valdez	1,541	Gen. (NPA)	17	Hospital burned 1947. Temporary 17-bed facility closed 1948—lack of personnel—no beds available now.	50-bed hospital with 20 beds for TB isolation.		Critical need—no facility available. Community often cut off during winter. High on priority list.
Wrangell	1,300	Gen. (CH)	13	Opened 1924. Non-fire resistive, two-story structure. Inadequate space.		10-bed addition for TB isolation	Construction of staff quarters would release more space in present facility for patients.

KEY TO TYPE FACILITIES RECOMMENDED IN TABLE D

SEPARATE FACILITIES		COMBINED FACILITIES (Hospital-Health Center)
URBAN (Without Living Quarters)	RURAL (With Living Quarters)	
A Office Space for 8-12 Personnel Waiting Room 3 Clinic Rooms Utility Room Class Room Laboratory Lavatory Facilities	D (Headquarters Station for Itinerant Personnel) Health Center Waiting Room Clinic Room-Office Utility Room Class Room (Optional) 1 One-Bed Treatment Room 1 Two-Bed Treatment Room Lavatory	F Same as Urban "B" with Living Quarters in Hospital or Elsewhere
B Office Space for 5-10 Personnel Waiting Room 2 Clinic Rooms Utility Room Class Room Lavatory Facilities	E (Substation for Itinerant Personnel) Health Center Waiting Room Clinic Room-Office 2 One-Bed Treatment Rooms Lavatory	G Same as Urban "B" with Living Quarters as in Rural "D"
C Office Space for 2-3 Personnel Waiting Room Clinic-Class Room Combined Small Utility Room Lavatory	Living Quarters Living Room Bedroom Kitchen Bath Small Bedroom for Visiting Staff	

TABLE D

ANALYSIS OF EXISTING HEALTH CENTER FACILITIES ALASKA, 1949

Location Existing or	Population of Area Served	Type and Adequacy of Existing Facility	RECOMMENDATIONS			
			Separate Facility	Combined Facility		Expansion of Existing Health Center
				Addition to Existing Hospital	Addition to New Hospital	
Anchorage	20,000 (City, plus immediate vicinity—Mt. View, etc.)	2-story (first floor and basement) frame building, housing 7 Public Health Nurses, Sanitarian, part-time Health Officer, Branch Laboratory of Department of Health, Custodian's living quarters; clerical staff. Inadequate to meet present and future needs.				
Anvik	200	NONE. Episcopal Mission located here. Public Health Nurse needed for part of lower Yukon (Anvik to Holy Cross to Marshall). Quarters and Health Center needed before a nurse can be assigned.	Rural D			
Bethel	2,608 (Area served extends to mouth of Kuskokwim River)	Small Health Center and living quarters combination in town. Frame structure.		G or G Health Center and living quarters should be added to present A.N.S. Hospital or to new A.N.S. hospital. No space now available. Remodelling the hospital, however.		
Cordova	2,351	Small facility—Center combined with law office. Inadequate space. Should be combined with new hospital.			F	
Dillingham	405 (Winter) (Estimated summer pop- ulation is 2000-3000)	NONE. Public Health Nurse rents room for living quarters. Only available office space at Government Hospital 5 miles out of town. Hospital not accessible as Health Center. Often cut off in winter.	Rural D			
Douglas	525	NONE. Families must go 2 miles across Gastineau Channel to Juneau Health Center, which is inadequate for Juneau's needs.	Urban C			

TABLE D—(Continued)

Location Existing or Proposed	Population of Area Served	Type and Adequacy of Existing Facility	RECOMMENDATIONS			
			Separate Facility	Combined Facility		Expansion of Existing Health Center
				Addition to Existing Hospital	Addition to New Hospital	
Fairbanks	16,542	4 small rooms set off from the Public Library. Inadequate for size staff and amount of service rendered in populous and growing area.	Urban A			
Fort Yukon	800	NONE. No facility for entire area nearer than Fairbanks.		Episcopal Hospital needs to be rebuilt.	G	
Glenn Allen (Highway)	720 ¹	NONE. Public Health Nurse for this area must work from headquarters at Fairbanks, 360 miles distant.	Rural E			
Haines	1,301 (Steady expansion expected)	Health Center in church mission. Unsatisfactory arrangement for community health service. Nurses living quarters in abandoned A.N.S. school building.			G	
Hoonah	750	Condemned A.N.S. facility. Frame construction	Rural D			
Hydaburg	351	Present Center to be abandoned—entirely inadequate.	Rural E			
Juneau	8,546	A converted old frame building; partitioned off into 3 rooms. Facilities entirely inadequate for amount of service rendered.	Urban A			
Kake	419	Health Center consists of one room in old school. Entire building needs to be rebuilt. Present space inadequate.	Rural E			
Ketchikan	8,561	2-story (first floor and basement) structure housing 2 Public Health Nurses, part-time Health Officer, Sanitarian, Branch Laboratory of Department of Health, clerical staff. Inadequate for needs of immediate future.				3rd floor addition plus garage facilities. (2 cars)

¹Entire highways area population (not including summer transient Road Commission workers) about 1,500.

Health Centers at Glenn Allen and Tok Junction will each serve about 1/2 of highways area population.

TABLE D—(Continued)

Location Existing or Proposed	Population of Area Served	Type and Adequacy of Existing Facility	RECOMMENDATIONS			Expansion of Existing Health Center
			Separate Facility	Combined Facility		
				Addition to Existing Hospital	Addition to New Hospital	
Kodiak	4,064	Combined living quarters (chiefly) and 1 small room for Health Center. Center serves Kodiak Island area as well as Kodiak.		F		
Kotzebue	1,937	NONE. Public Health Nurse works out of A.N.S. Hospital. No Health Center facilities.		G or G Health Center and living quarters should be added to present A.N.S. Hospital, or to new A.N.S. Hospital. No space available now, but hospital being remodelled.		
Mt. Village	265	NONE. Public Health Nurse needed for Lower Yukon (Marshall to Coast) and down Bering Sea Coast to Scammon Bay and Hooper Bay. Nurse cannot be assigned until quarters are provided.	Rural D			
Naknek	405 (Winter) (Summer population estimated 2,000-3,000)	NONE. Public Health Nurse now has office in her living quarters—2 rented rooms. Health Center at Naknek would also serve villages in surrounding area.	Rural D			
Nome	5,503	New facility combined with new hospital--under construction—to be completed 1949.			F	
Palmer	2,000	One attic room in frame building, which houses recreation center downstairs. Steep narrow stairs to poorly lighted quarters. Building is 13 years old, and may be sold at any time. Running water and other facilities inaccessible to Health Center.		Community hospital burned in 1946.	F	
Petersburg	2,213	2 small rooms in attic of condemned Indian Service School building of frame construction. Narrow, steep stairs to poorly ventilated, poorly lighted quarters. Kindergarten held in emergency first floor quarters.		Present Community hospital of frame construction badly in need of replacement.	F	

TABLE D—(Continued)

Location Existing or Proposed	Population of Area Served	Type and Adequacy of Existing Facility	RECOMMENDATIONS			
			Separate Facility	Combined Facility		Expansion of Existing Health Center
				Addition to Existing Hospital	Addition to New Hospital	
Pt. Barrow	2,387	NONE. Public Health Nurse works out of A.N.S. Hospital. No other facilities available locally.		G or G Health Center and living quarters should be added onto present A.N.S. Hospital, or as a part of new A.N.S. hospital when one is built.		
St. Lawrence Island Savoonga	500	Health Center formerly in school which burned. Nurse's cabin still stands. A separate new installation with living quarters for itinerant service at Gambell would be adequate if a "D" type facility is provided at Savoonga.	Rural D			
Sand Point	605	NONE. No Public Health Nurse coverage or medical care of any kind for Alaska Peninsula. Barge Unit will serve Peninsula, Aleutian Islands, and all Bering Sea Coast. Full time field nurses needed for year-round service Alaska Peninsula.	Rural E			
Seldovia	900 (Including Homer, Port Graham, Portlock)	Second floor (2 large rooms) of frame building at end of town. Library on first floor.		F Plans call for expansion of existing hospital.		
Seward	2,208	Facility consists of 2 rented rooms (\$70.00 per month.) Inadequate space for rendering needed services.	Urban B			
Shishmaref	410	NONE. No Public Health Nurse coverage or medical care of any kind for Upper Seward Peninsula. Public Health Nurse attempts covering area from Nome, several hundred miles distant.	Rural D			
Sitka	3,581	Rear room in city fire hall. Inadequate for services rendered to sizeable population group.		No community hospital in existence now. One is badly needed.	F	

TABLE D—(Continued)

Location Existing or Proposed	Population of Area Served	Type and Adequacy of Existing Facility	RECOMMENDATIONS			
			Separate Facility	Combined Facility		Expansion of Existing Health Center
				Addition to Existing Hospital	Addition to New Hospital	
Skagway	1,305	2 small rooms in frame building—recently renovated and adequate for immediate needs. Should be rebuilt if proposed industrial expansion of community takes place.	Rural D			
Sleitmut	500 (Area along Kuskokwim River to Bethel, including McGrath)	NONE. Upper Kuskokwim receives practically no Public Health Nurse or other health services, as there is no facility or living quarters at upper end of River. Nearest Public Health Nurse at Bethel, 200 miles from Sleitmut, 300 miles from McGrath.	Rural E			
Tanana	300	NONE. Public Health Nurse works out of A.N.S. Hospital. No other facilities available locally.		G or G Health Center should be built as addition to existing hospital, or as part of new hospital.		
Tok Junction (Highway)	723 ¹	NONE. Public Health Nurse for this area must work from headquarters at Fairbanks, 200 miles distant	Rural E			
Valdez	1,541 (Including Prince William Sound area)	Converted frame building owned by town, but land site not owned by city. Serves Prince William Sound area plus town of Valdez.		Community hospital burned in 1946. Construction of new facility planned if and when funds are available.	F	
Wrangell	1,300	2 rooms in Federal Building. Subject to eviction at any time, as regulations provide for the housing of Federal offices only in Federal building.		Present Community hospital needs replacement. Frame structure in "fair condition."		

Method Used for Computing Construction Costs for Community Facilities in Alaska

Construction costs in the different sections of Alaska are affected chiefly by such factors as the accessibility of the area to regular shipping routes; local labor costs; local availability and demand for building materials and construction equipment; and, in certain areas, the need for modification of standard construction procedures because of terrain, climate or other factors.

In Southeastern Alaska, which has ready access to year-round shipping points, a fairly tight labor and materials market, a moderate climate and no special problems of terrain other than steep grades, construction costs are approximately $1\frac{1}{2}$ times as high as the average cost of construction in continental United States. The increase in cost in this area is due chiefly to high shipping rates, high wages and a continued demand for construction materials.

Construction costs in the upper Interior, on the other hand, are five times as high as the United States average, and almost $3\frac{1}{2}$ times the cost in Southeastern Alaska. In the Fort Yukon area, for example, all construction equipment and materials must be shipped by water to the nearest port on the Gulf of Alaska at

Seward, where all cargoes are transferred to the Alaska Railroad, taken to the Tanana River, put on the river boat downstream to the Yukon River and then up to Fort Yukon. During the winter in Interior Alaska, all materials must be transported by air or overland by dogsled. Otherwise the equipment and materials must be flown directly from Outside points to Fairbanks, and transplaned to Fort Yukon at high rates.

Skilled labor forces for construction in the Fort Yukon area are practically non-existent, and workmen for any extensive project must be imported to the area from elsewhere in the Territory or from continental United States. In addition, Fort Yukon lies within the 60% of Alaska which is underlaid by permanently frozen ground (permafrost). This fact alone considerably complicates the task of the designer and engineer, and raises the cost of construction accordingly, of both utility and building construction. Because of the permafrost and the prolonged periods of low temperatures, standard water and waste disposal systems are impractical and uneconomical in this area. Therefore, specially designed systems, such as recirculating or utilidor sys-

tems, must be planned and installed. Both systems are necessarily much more expensive than usual installations. The effects of the permafrost also necessitate certain modifications of building design and construction so that the costs of erecting hospitals and health centers is also greater in permafrost.

ESTIMATING COSTS OF UTILITY CONSTRUCTION IN ALASKA

Figure 3 has been prepared as a guide in making gen-

eral estimates for construction costs of various types of utility systems in Alaska. The four curves of the graph indicate the approximate per capita cost of constructing each of four types of water or waste disposal systems on the basis of population size. The map indicates the cost indices which must be applied in different sections of the Territory. By way of illustration, if the cost of constructing a recirculating water system for Fairbanks is to be computed, the following formula is used in connection with the graph and map:

Design population of Fairbanks ¹	×	Per capita cost of recirculating system (curve No. 2 on graph)	×	Cost index for Fairbanks area (from map)	=	Estimated cost ²
10,000	×	\$68	×	3	=	\$2,040,000

In working out the estimated costs for utility construction, some adjustment of the 5-10% population in-

crease will be necessary in certain instances. On the basis of location, past development and current economic status, it is more-or-less obvious that some of the smaller communities will remain static or may even regress as far as population is concerned, if their present residents should emigrate to other areas where more permanent, year-round employment is available. Such adjustments should be based entirely on subjective

¹Design population equals the estimated population of a community as of 10 years from date, assuming a reasonable rate of increase for most communities of 5-10% over the 10-year period. Ultimate design should consider both 10 and 25 year population increases.

²Construction costs computed on the above basis cannot be more than general approximations because of the large number of variables involved.

judgment which can safely be applied only by persons who are thoroughly familiar with the pattern of development in Alaska and are therefore capable of estimating trends.

ESTIMATING COSTS OF HEALTH CENTER CONSTRUCTION IN ALASKA

Figure 4 indicates the average cost of constructing various types of health centers recommended for Alaska on the basis of current construction costs in the continental United States. By applying the cost indices

for the different sections of Alaska as given in the map (Fig. 3), the approximate cost of constructing any one of the seven types of health centers in any given section of the Territory may be estimated roughly. These costs necessarily include only the construction of the building and any built-in equipment, but do not include movable equipment or furnishings.

The approximate cost of constructing a type D Rural health center at Naknek, for example, would be computed as follows:

Average cost of constructing a type D Rural health center in the U. S. (Fig. 4)	×	Cost index for Naknek area (map, Fig. 3)	=	Estimated cost of constructing type D Rural facility at Naknek ²
\$10,000	×	3	=	\$30,000

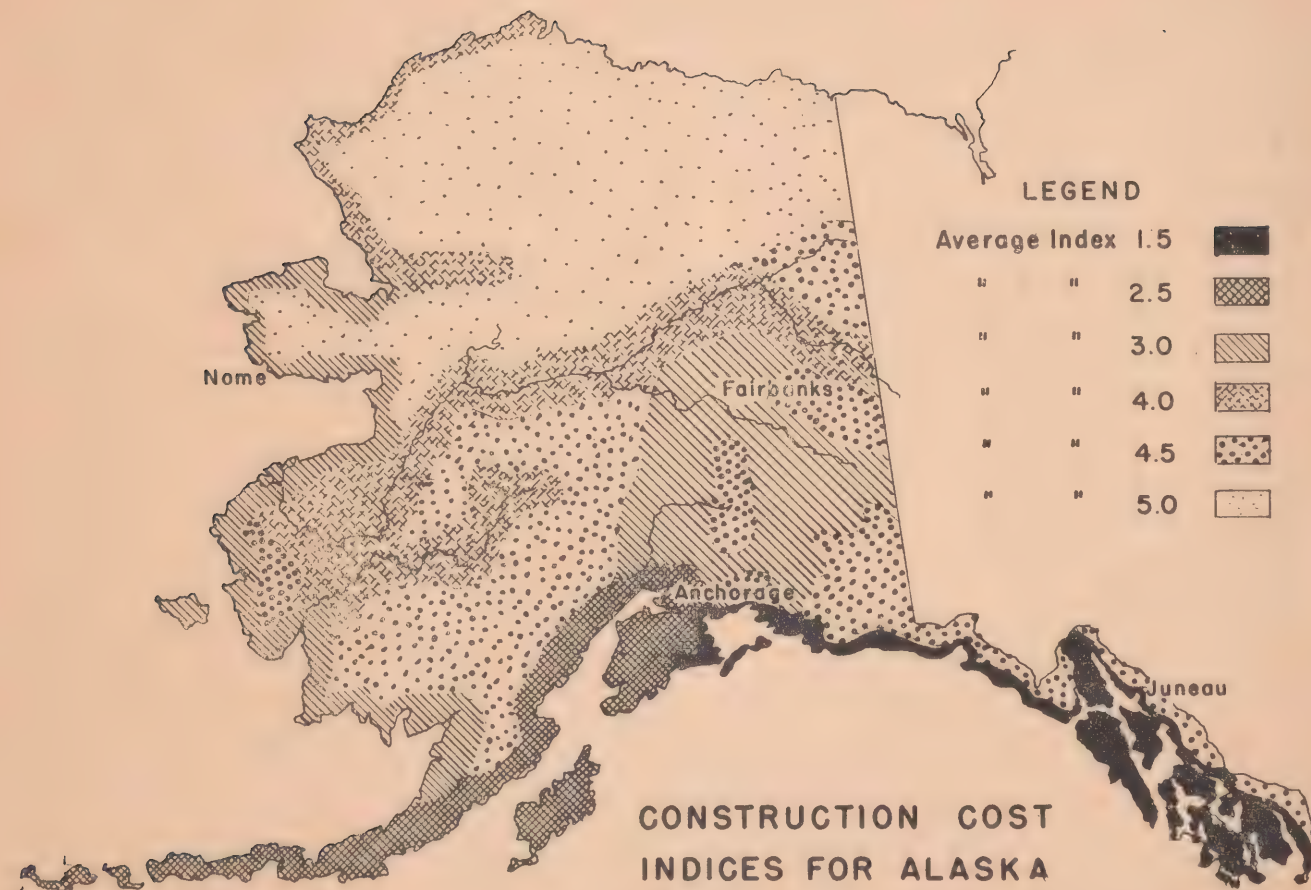


Figure 3

PER CAPITA COST CURVES WATER and SEWER UTILITIES for ALASKAN TOWNS

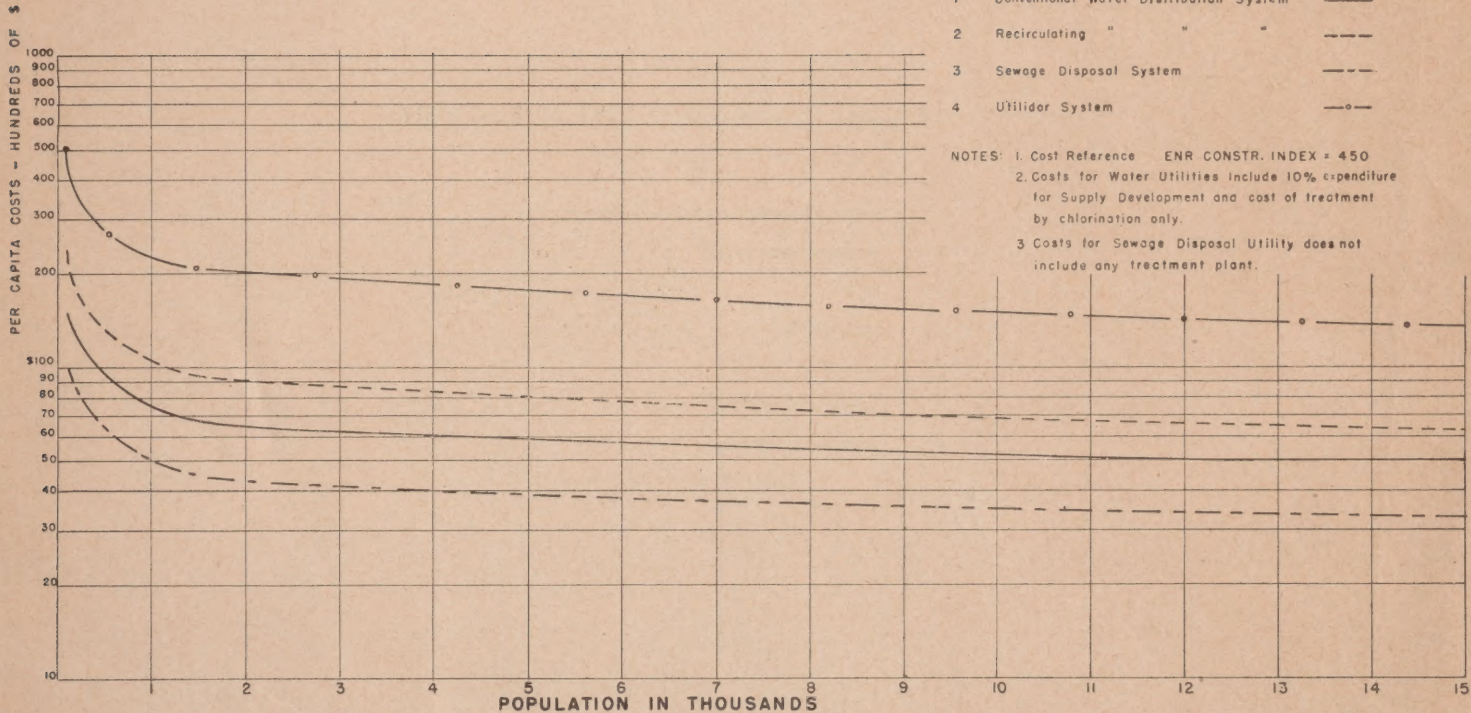


Figure 3

DIAGRAM FOR ESTIMATING HEALTH CENTER CONSTRUCTION COSTS

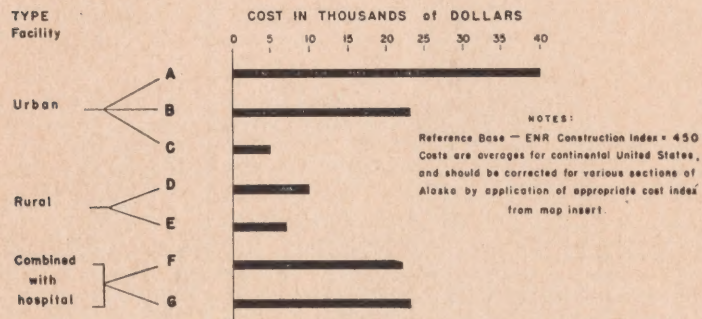


Figure 4

PRESSBOARD
PAMPHLET BINDER

Manufactured by
GAYLORD BROS. Inc.
Syracuse, N. Y.
Stockton, Calif.

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